

**Knowlton, F. H.**

Evolution of geologic climates. (Reprinted from Bull. of the Geological society of America, vol. 30, pp. 499-566. Published Dec. 31, 1919.)

**Köhler, Hilding.**

Studien über die Nebelfrostablagerungen auf dem Pärtetjäkko. Stockholm. 1919. 38 p. 26 cm. (Naturwissenschaftliche Untersuchungen des Sarekgebirges in Schwedisch-Lappland. Bd. 2, Abt. 1, Lief. 1. Sonderabdruck.)

**Kohlschütter, V.**

Nebel, Rauch und Staub. Berlin. 1918. 36 p. 24 cm.

**Leiva, Elías.**

Climatología de Costa-Rica. Guatemala. 1919. p. 181-185. 25 cm. (Excerpted from "Centro-América," Guatemala, vol. 12, no. 2. Abril-Junio, 1920.)

**Lempert, R. K. G.**

Meteorology. London. 1920. 186 p. 19 $\frac{1}{2}$  cm.

**Marcillac, Paul.**

La lutte contre la grêle et la foudre. Paris. 1919. 79 p. 18 $\frac{1}{2}$  cm.

**Negro, Carlo.**

Sul clima della Libia attraverso i tempi storici. Memoria 4. Roma. 1919. 51 p. 28 cm. (Estratto dalle Memorie della Pontificia accademia dei Nuovi lincei. Ser. 2, vol. 5.)

Sulla frequenza degli aloni. Nota 6.—Groenlandia. Roma. 1919. 7 p. 29 $\frac{1}{2}$  cm. (Estratto dagli Atti della Pontificia accademia romana dei Nuovi lincei. Sessione 7a, del 15 Giugno 1919.)

Sulla frequenza degli aloni. Nota 7.—Penisola Scandinavia. Roma. 1919. 16 p. 29 $\frac{1}{2}$  cm. (Estratt dagli Atti della Pontificia accademia romana dei Nuovi lincei. Sessione 1a, del 21 Diciembre 1919.)

**Richarz, F.**

Über des Farbe des Mondes. Farbenerscheinungen an Wasserfällen und am Wolken. Marburg. 1917. p. 11-14. 22 cm. (Sonderabdruck aus den Sitzungsb. der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg, Nr. 1.)

**Roget, François Roget.**

Altitude and health. London. 1919. 186 p. 22 $\frac{1}{2}$  cm.

**Rosenkranz, Johanna.**

Beziehungen zwischen den Schwankungen des Klimas und der Produktion in Australien. Hamburg. 1917. 50 p. 24 cm. (Inaug.-Dis.—Kiel.)

**Schultz, Bruno.**

Die periodischen und unperiodischen Schwankungen des Mittelwasserstandes an der flandrischen Küste (Okt. 1915-Sept. 1918). Hamburg. 1920. 27 p. 29 cm. (Deutsche Seewarte. Aerologische und hydrographische Beobachtungen der deutschen Marine-Stationen während Kriegszeit 1914-1918. Heft 1. Hydrographische Untersuchungen.)

**Schwartz, E. H. L.**

The Kalahari, or thirstland redemption. Cape Town. [n. d.] 163 p. 22 cm.

**Schweidler, E. v., & Kohlrausch, K. W. L.**

Atmosphärische Elektrizität. Leipzig. 1915. p. 193-276. 26 cm. (In Handbuch der Elektrizität und des Magnetismus. Band 3. Lieferung 2.)

**Sifontes, Ernesto.**

Notas breves sobre climatología tropical. Bolívar. 1920. Excerpts from El Luchador, June 5, 12, 19, and 26, 1920.]

**Skard, O. M.**

Om frostskaden paa frugtræerne i Lier aarne 1915-1918. Kristiania. 1918. 32 p. 22 $\frac{1}{2}$  cm. (Sætryk av "Norsk havetidende." Nr. 17-18, 1918.)

**Tenani, Mario.**

Calcolo della densità dell' aria alle varie altezze fino a 10,000 metri, in base alle osservazioni italiane. Vigna di Valle. 1918. 18 p. 31 cm. (Battaglione dirigibili. R. Stazione aerologica principale di Vigna di Valle.)

Nuove tabelle per la determinazione delle altezze per mezzo del barometro. Vigna di Valle. 1919. 13 p. [manifolded]. (R. Stazione aerologica principale.)

**enani, Mario.**

Lo stato presente della nostra conoscenza della temperatura dell' alta atmosfera in Italia. Roma. 1918. 22 p. 31 cm. (Estratto dalle Memorie del R. Osservatorio astronomico al collegio romano. Serie 3, vol. 7, parte 1.)

**Toepfer, Max.**

Gewitter und Blitze. Dresden. 1917. 16 p. 18 $\frac{1}{2}$  cm. (Sonderabdruck aus den Verbands-Mitteilungen der Vereinigung: Dresdner Bezirksvereine deut. Ingenieure und Dresdner Elektrotechn. Verein.)

**Van Buskirk, J. D.**

Climate of Korea and its probable effect on human efficiency. 59 p. 22 $\frac{1}{2}$  cm. (Reprinted from Transactions of the Korea branch of the Royal Asiatic society, vol. 10, 1919.)

**Wagner, Edgar.**

Regenkarten von Elsass-Lothringen mit erläuternden Text und Tabellen. Strassburg. 1916. p. 23-123. 23 cm. (Excerpted from Mitteilungen der Gesellschaft für Erdkunde und Kolonialwesen zu Strassburg i. E. für das Jahr 1914. Heft 5.)

**Wallén, Axel.**

Nederbörd avrinning och avdunstning i Lagans vattenområde. 2. Vattenhuskällningen under årets lopp. Stockholm. 1920. 37 p. 20 $\frac{1}{2}$  cm. (Särtryk ur Teknisk Tidskrift, Vag- och Vattenbyggnadskonst, Häft 3, 1920.)

**Westman, J.**

Stärke der Sonnenstrahlung im Mittelschwedischen Ostseegebiet März 1918-Mai 1919. Nyköping. 1920. 24 p. 31 cm. (Meddelanden från Statens meteorologisk-hydrografiska anstalt. Band 1, nr. 1.)

**RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.**

C. F. TALMAN, Professor in Charge of Library.

The following titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is not a complete index of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau.

*Astronomie. Paris. 34. année. 1920.*

**Raymond, G.** Contribution à l'étude du mistral. p. 335-336. (juil.) [Effects on growth of trees.]

**Störmér, Carl.** L'aurore boréale du 22-23 mars 1920 observée dans la Norvège. p. 422-424. (sept.)

*California citograph. Los Angeles. v. 5. Feb., 1920.*

**Woglum, R. S.** Value of weather records in fumigation. p. 110-111.

*California citograph. Los Angeles. v. 6. Nov., 1920.*

**Carpenter, Ford A.** Is your thermometer correct? p. 7.

**Young, Floyd D.** Smoke cover and direct radiation in frost protection. p. 6.

*Ciel et terre. Bruxelles. 36. année. 1920.*

**J.** La foudre globulaire et les travaux du Prof. I. Galli. p. 140-145. (mai-juin.)

**Rossignol, Jules.** Les feux follets méritent-ils une place et une théorie parmi les météores lumineux de l'atmosphère? p. 177-180. (juil.-août.)

**Rouch, J.** Les applications de la météorologie pendant la guerre. p. 151-157. (juil.-août.)

*France. Académie des sciences. Comptes rendus. Paris. Tome 171. 1920.*

**Besson, Louis.** Relations entre les éléments météorologiques et le nombre de décès par maladies inflammatoires des organes de la respiration, à Paris. p. 686-688. (11 oct.) [Abstract in Mo. WEATHER REV., Sept., 1920, 48:507.]

**Danjon, A., & Rougier, G.** Le spectre et la théorie du rayon vert. p. 814-817. (26 oct.)

**Rouch, J.** Sur la variation diurne de la température dans l'Antarctique. p. 866-868. (2 nov.) [Abstract in this REVIEW, p. 600.]

*Geographical review. New York. v. 10. 1920.*

**Brooks, Charles F.** Notes on the climate of Panama. p. 268-269. (Oct.) [Based on articles in Mo. WEATHER REV.]

**Ward, Robert DeC.** New series of sunshine maps of the United States. p. 339-341. (Nov.) [Refers to maps in Mo. WEATHER REV., 1919, 47:631-632.]

*Hemel en Dampkring. Den Haag. 18. Jaarg. Oct., 1920.*

**Visser, S. W.** Een halo in de tropen. p. 86-89.

- Jahrbuch der Radioaktivität und Elektronik. Leipzig. Bd. 17. Heft 1. 1920.*
- Gschwend, Peter.** Beobachtungen über die elektrischen Ladungen einzelner Regentropfen und Schneeflocken. p. 62-79.
- Japan. Central meteorological observatory. Bulletin. Tokyo. v. 3, no 2. 1920.*
- Nakamura, Saemontarō.** Researches on seismic waves. p. 57-94.
- Journal de physique et radium. Paris. Tome 1. ser. 6. août, 1920.*
- Bjerknes, V.** La météorologie de la zone tempérée et la circulation générale de l'atmosphère. p. 58-62.
- Journal of geology. Chicago. v. 28. Oct.-Nov., 1920.*
- Matsuyama, Motonori.** On some physical properties of ice. p. 607-631.
- Meteorological magazine. London. v. 55. 1920.*
- Giblett, M. A.** Visibility on cloudy nights. p. 173-174. (Sept.)
- Retirement of Sir Napier Shaw, Sc. D., LL. D., F. R. S.** p. 161-164. (Sept.)
- Shaw, Napier.** Sir Joseph Norman Lockyer, K. C. B., LL. D., D. Sc., F. R. S. p. 181-182. (Sept.) [Obituary.]
- Shaw, William Napier.** Conference at Bergen. p. 166-168. (Sept.) [Describes forecasting methods of Bjerknes and his associates.]
- Bonacina, L. C. W.** Hill-fog in relation to rainfall. p. 214-217. (Nov.)
- Meteorologische Zeitschrift. Braunschweig. Bd. 37. 1920—Continued.*
- Hellmann, G.** Temperaturanomalien von langer Dauer. p. 221-223. (Aug.)
- Köppen, W.** Über die Aufeinanderfolge warmer und kalter Monate in Norddeutschland. p. 223-225. (Aug.)
- Reich, Alois.** Elektrische Insolation und Zyklone. p. 235-237. (Aug.)
- Wegener, Alfred.** Turbulenz und Kolloidstruktur der Atmosphäre. p. 231-232. (Aug.)
- Ficker, H.** Veränderlichkeit des Luftdruckes und der Temperatur in Russland zwischen Eismeer und 37° Nordbreite. p. 260-261. (Sept.)
- Hann, J.** Der tägliche Gang des Luftdruckes zu Tripoli. p. 264-265. (Sept.)
- Marten, W.** Normalwerte der Sonnenstrahlung in Potsdam. p. 252-258. (Sept.)
- Popoff, Kyrill, & Stainoff, G.** Über eine Methode zur Höhenbestimmung. p. 263-264. (Sept.)
- Resultate der meteorologischen Beobachtungen am Samoa-Observatorium in den Jahren 1913 bis 1915.** p. 262-263. (Sept.)
- Schubert, Joh.** Die relative Bewegung auf einer rotierenden Scheibe und an der Erdoberfläche. p. 259-260. (Sept.)
- Wenger, R.** Neue Grundlagen der Wettervorhersage. p. 241-252. (Sept.)
- Cannegieter, H. G.** Zur Frage der überadiabatischen Temperaturgradienten. p. 298-299. (Okt.)
- Exner, Felix M.** Wind und Luftdruck nach Untersuchungen in England. p. 275-281. (Okt.)
- Hellmann, G.** Welchen Einfluss hat der Krieg 1914/18 auf die Meteorologie gehabt? p. 273-275. (Okt.)
- Radakovic, M.** Über Ableitungen der ablenkenden Kraft der Erddrehung. p. 296-297. (Okt.)
- Róna, S.** Temperaturänderung adiabatisch auf- und absteigender Luft. p. 281-292. (Okt.)
- Schmauss, A.** Randbemerkungen VI. p. 292-296. (Okt.)
- National academy of sciences. Proceedings. Washington. v. 6. Aug., 1920.*
- Goddard, Robert H.** Possibilities of the rocket in weather forecasting. p. 493-495.
- Nature. London. v. 106. 1920.*
- Gold, E.** Dr. Max Margules. p. 286-287. (Oct. 28.) [See this REVIEW, p. 60.]
- Cramer, H.** Die Bedeutung der Windkarten für die Wettervorhersage. p. 161-162. (Juni.)
- Defant, A.** Über die Beziehung zwischen Niederschlag und synoptischer Windverteilung. p. 162-163. (Juni.)
- Dember, H. & Uibe, M.** Bewegung des Erdschattens in der Atmosphäre. p. 170-171. (Juni.) [Abstract.]
- Ficker, Heinrich.** Die Änderung der Grösse der Luftdruckschwankungen in den untersten Schichten der Atmosphäre. p. 145-151. (Juni.)
- Georgii, W.** Ein Beitrag zur Wolken- und Nebelvorhersage. p. 159-161. (Juni.)
- Keränen, J.** Zur Frage der Ableitung des Tagesmittels aus Terminbeobachtungen. p. 166-168. (Juni.)
- Koschmieder, Harald.** Der Wintersirocco von El Fule. p. 156-159. (Juni.)
- Schmauss, A.** Randbemerkungen V. p. 152-155. (Juni.)
- Stüring, R.** Registrierung der Erdbodenstemperatur in Potsdam. p. 168-170. (Juni.)
- Bergwitz, Karl.** Julius Elster. p. 194-196. (Juli.) [Obituary.]
- Ficker, Heinrich.** Die Abnahme der Veränderlichkeit des Luftdruckes mit der Höhe. p. 184-189. (Juli.)
- Hanzlik, Stanislav.** Über die Beziehung der gleichzeitigen Luftdruckschwankungen zur Sonnentätigkeit. p. 196-197. (Juli.)
- Kassner, C.** Ein neuer meteorologischer Film. p. 203-204. (Juli.)
- Peppler, W.** Ergebnisse der Lindenberger Messungen der Wolkenhöhen mit Drachen und Fesselballons. p. 189-193. (Juli.)
- Schindelhauer, F.** Über den Einfluss der Schichtung der Atmosphäre auf die Ausbreitung der Wellen der drahtlosen Telegrafie. p. 177-184. (Juli.)
- Schmauss, A.** Das quantenmässige Geschehen in der Meteorologie. p. 202-203. (Juli.)
- Brückmann, W.** Über Versuche mit elektrischen Thermometern. p. 209-213. (Aug.)
- Conrad, V.** Dr. C. Braak, Schwankungen der atmosphärischen Zustände langer und kurzer Perioden im Malaiischen Archipel und den Nachbargebieten. Die Möglichkeit einer Voraussage. p. 225-228. (Aug.)
- Defant, A.** H. Hergesell, die Strahlung der Atmosphäre unter Zugrundlegung von Lindenberger Temperatur- und Feuchtigkeitsmessungen. p. 213-216. (Aug.)
- Hartmann, Wilhelm.** Über die Entstehung von Mammato-Formen. p. 216-220. (Aug.)
- Saunders, Frederick A.** Visible sound waves. p. 442. (Nov. 5.)
- Platt, H. H.** Road reflections. p. 467. (Nov. 12.)
- Scientific American monthly. New York. v. 2. Nov., 1920.*
- Cordeiro, F. J. B.** Glacial and genial epochs. An astronomical explanation of the glacial periods. p. 197-198.
- Scientific monthly. New York. v. 11. Dec., 1920.*
- Ward, Robert DeC.** Essential characteristics of United States climates. p. 555-568.

*Sociedad astronómica de España y América. Revista. Barcelona. Año 10. Sep.-Oct., 1920.*

**Selga, Miguel.** Velocidad del viento y de los dirigibles. p. 83-95.

*Sociedad científica "Antonio Alzate." Memorias y revista. México. Tomo 37. Agosto, 1920.*

**Mary, Albert, & Mary, Alexander.** Études de météorologie plasmogénique. p. 153-162

*Sociedad científica "Antonio Alzate." Memorias y revista. México. Tome 38. Julio, 1920.*

**López, Elpidio, & Hernández, Jesús.** Las observaciones higrométricas en México. p. 389-399.

*Società meteorologica italiana. Bollettino bimensuale. Torino. v. 38. Giug.-Nov., 1919.*

**Chiostoni, Ciro.** Contributo allo studio dell'altezza specifica e della densità della neve. p. 3-6.

**Crestani, Giuseppe.** Dell'extrapolazione lungo la verticale delle frequenze del vento. p. 6-9.

**Marvin, Charles F.** Note elementari sui minimi quadrati, sulla teoria della statistica e della correlazione, per la meteorologia e per l'agricoltura. p. 10-32. [Trans. from Mo. WEATHER, Rev., 1916, 44: 551-568.]

*Società meteorologica italiana. Bollettino bimensuale. Torino. v. 39. Dic., 1919-Mar., 1920.*

**Crestani, Giuseppe.** Le nubi temporalesche. p. 5-9.

**Marini, L.** Il posto della meteorologia fra le scienze. p. 9-16.

## SPECIAL OBSERVATIONS.

### SOLAR AND SKY RADIATION MEASUREMENTS DURING OCTOBER, 1920.

By HERBERT H. KIMBALL, Meteorologist.

[Solar Radiation Investigations Section, Washington, Nov. 30, 1920.]

For a description of instruments and exposures, and an account of the method of obtaining and reducing the measurements, the reader is referred to this Review for April, 1920, 48:225.

The monthly means and departures from normal in Table 1 indicate that solar radiation intensities were close to normal values at all stations except Washington, D. C., where they were decidedly below normal, due to the haze that prevailed during the second, third, and fourth weeks. Noon intensities of 1.57 calories per minute per square centimeter, measured at Santa Fe on the 15th and 28th, equal the maximum noon readings previously obtained at that station in October.

For the month as a whole there was an excess in the total radiation received on a horizontal surface at all three stations.

Sky light polarization measurements obtained on 10 different days at Washington give a mean of 56 per cent and a maximum of 64 per cent on the 6th. Measurements obtained at Madison on 12 days give a mean of 63 per cent, and a maximum of 76 per cent on the 29th. These are only slightly below average values for October for the respective stations.

TABLE 1.—*Solar radiation intensities during October, 1920.*

[Gram-calories per minute per square centimeter of normal surface.]

#### WASHINGTON, D. C.

| Date.       | Sun's zenith distance.      |           |       |       |       |       |                                 |       |       |       |
|-------------|-----------------------------|-----------|-------|-------|-------|-------|---------------------------------|-------|-------|-------|
|             | s.a.m.                      | 78.7°     | 75.7° | 70.7° | 60.0° | 0.0°  | 60.0°                           | 70.7° | 75.7° | 78.7° |
|             | 75th me-<br>ridian<br>time. | Air mass. |       |       |       |       | Local<br>mean<br>solar<br>time. |       |       |       |
|             | e.                          | 5.0       | 4.0   | 3.0   | 2.0   | *1.0  | 2.0                             | 3.0   | 4.0   | 5.0   |
| Oct. 1      | mm.                         | cal.      | cal.  | cal.  | cal.  | cal.  | cal.                            | cal.  | cal.  | mm.   |
| 2           | 6.50                        | 0.71      | 0.75  | 0.87  | 1.05  | 1.28  | 0.88                            | 0.76  | 0.61  | 5.79  |
| 4           | 5.79                        | 0.80      | 0.90  | 1.05  | 1.28  |       |                                 |       |       | 5.36  |
| 5           | 8.18                        |           |       |       |       | 1.13  |                                 |       |       | 10.21 |
| 6           | 8.18                        |           |       |       |       | 0.65  |                                 |       |       | 7.29  |
| 7           | 5.56                        | 0.90      | 1.02  | 1.15  | 1.31  |       |                                 |       |       | 4.95  |
| 8           | 6.02                        | 0.86      | 0.97  | 1.10  | 1.25  | 1.45  | 1.24                            | 1.09  | 0.93  | 5.36  |
| 11          | 8.81                        |           |       |       |       | 0.61  | 0.85                            | 0.89  | 0.63  | 0.51  |
| 12          | 10.97                       |           |       |       |       | 0.97  | 0.84                            | 0.64  | 0.31  | 7.57  |
| 14          | 9.83                        |           |       |       |       | 0.47  | 0.73                            | 0.91  |       | 8.18  |
| 15          | 9.83                        |           |       |       |       | 0.34  |                                 |       |       | 9.83  |
| 20          | 10.59                       | 0.28      | 0.37  | 0.51  | 0.70  |       | 0.64                            | 0.41  |       | 10.59 |
| 21          | 10.59                       |           |       |       |       | 0.39  | 0.57                            | 0.55  | 0.39  | 0.25  |
| 22          |                             |           |       |       |       | 0.55  | 0.76                            | 0.62  | 0.63  | 0.45  |
| 23          |                             |           |       |       |       | 0.55  | 0.78                            | 0.82  | 0.63  | 0.45  |
| 26          |                             |           |       |       |       | 1.12  |                                 | 1.14  | 0.94  | 0.74  |
| 29          | 14.60                       |           |       |       |       |       |                                 |       |       | 12.24 |
| Means.      | 3.63                        | 0.87      | 0.99  | 1.10  | 1.24  | 1.40  | 0.91                            | 0.71  | 0.59  | 4.57  |
| Departures. | -0.01                       | +0.02     | -0.13 | -0.14 | -0.17 | -0.17 | -0.15                           | -0.13 | -0.13 | -0.13 |

TABLE 1.—*Solar radiation intensities during October, 1920—Continued MADISON, WIS.*

| Date.       | Sun's zenith distance.         |           |       |       |       |      |       |       |       |       | Noon.<br>Local<br>mean<br>solar<br>time. |  |
|-------------|--------------------------------|-----------|-------|-------|-------|------|-------|-------|-------|-------|--|--|
|             | 8 a.m.                         | 78.7°     | 75.7° | 70.7° | 60.0° | 0.0° | 60.0° | 70.7° | 75.7° | 78.7° |  |  |
|             | 75th<br>me-<br>ridian<br>time. | Air mass. |       |       |       |      | A. M. |       |       |       |  |  |
|             | e.                             | 5.0       | 4.0   | 3.0   | 2.0   | *1.0 | 2.0   | 3.0   | 4.0   | 5.0   |  |  |
| Oct. 1      | 4.37                           |           |       |       |       | 1.16 | 1.35  |       | 1.23  | 1.06  | 4.37                                     |  |
| 2           | 3.81                           |           |       |       |       |      | 1.27  |       |       |       | 5.36                                     |  |
| 3           | 7.04                           |           |       |       |       | 1.12 |       |       |       |       | 5.56                                     |  |
| 4           | 5.56                           |           |       |       |       | 1.02 | 1.14  | 1.30  | 1.50  | 1.27  | 5.36                                     |  |
| 5           | 6.76                           |           |       |       |       |      | 0.98  |       |       |       | 5.79                                     |  |
| 6           | 7.87                           |           |       |       |       |      | 1.16  | 1.36  |       |       | 6.50                                     |  |
| 7           | 5.56                           |           |       |       |       |      | 1.10  |       |       |       | 6.76                                     |  |
| 8           | 7.04                           |           |       |       |       |      |       | 0.88  | 0.70  | 0.54  | 7.87                                     |  |
| 11          | 9.14                           |           |       |       |       |      |       | 1.07  |       |       | 10.97                                    |  |
| 12          | 9.47                           |           |       |       |       |      | 1.08  |       |       |       | 10.59                                    |  |
| 16          | 10.59                          |           |       |       |       |      |       | 1.24  |       |       | 9.83                                     |  |
| 20          | 12.24                          |           |       |       |       |      | 0.99  | 1.15  |       |       | 14.10                                    |  |
| 21          | 13.13                          |           |       |       |       |      | 0.83  |       |       |       | 15.11                                    |  |
| 29          | 2.87                           |           |       |       |       | 1.22 | 1.34  |       | 1.07  |       | 2.49                                     |  |
| Means.      |                                | (1.02)    | 1.16  | 1.14  | 1.36  |      | 1.15  | 0.96  | 0.79  |       |  |  |
| Departures. |                                | +0.13     | +0.11 | -0.02 | -0.02 |      | -0.02 | -0.05 | -0.10 |       |  |  |

#### LINCOLN, NEBR.

| Date.       | Sun's zenith distance.         |           |       |       |       |       |       |       |       |        | Noon.<br>Local<br>mean<br>solar<br>time. |  |
|-------------|--------------------------------|-----------|-------|-------|-------|-------|-------|-------|-------|--------|--|--|
|             | 8 a.m.                         | 78.7°     | 75.7° | 70.7° | 60.0° | 0.0°  | 60.0° | 70.7° | 75.7° | 78.7°  |  |  |
|             | 75th<br>me-<br>ridian<br>time. | Air mass. |       |       |       |       | A. M. |       |       |        |  |  |
|             | e.                             | 5.0       | 4.0   | 3.0   | 2.0   | *1.0  | 2.0   | 3.0   | 4.0   | 5.0    |  |  |
| Oct. 1      | 4.57                           |           |       |       |       | 1.00  | 1.11  | 1.31  | 1.51  | 1.26   | 3.99                                     |  |
| 2           | 2.67                           |           |       |       |       |       | 0.94  | 1.19  | 1.22  | 1.06   | 0.91                                     |  |
| 4           | 6.76                           | 0.80      | 0.90  | 1.04  | 1.24  |       | 1.24  | 1.45  | 1.26  | 1.10   | 0.95                                     |  |
| 5           | 6.76                           | 0.80      | 0.90  | 1.04  | 1.24  |       | 0.77  | 0.91  |       |        | 0.82                                     |  |
| 6           | 6.50                           |           |       |       |       | 1.06  | 1.27  | 1.48  | 1.64  | 1.42   | 7.29                                     |  |
| 11          | 9.47                           |           |       |       |       |       | 1.07  | 1.26  |       |        | 10.59                                    |  |
| 12          | 6.50                           | 0.94      | 1.05  | 1.19  | 1.30  |       |       |       | 1.28  | 1.11   | 0.97                                     |  |
| 16          | 6.50                           |           |       |       |       | 1.16  | 1.31  |       |       | 1.06   | 0.95                                     |  |
| 27          | 3.15                           |           |       |       |       | 1.26  | 1.40  |       |       | 1.06   | 0.85                                     |  |
| 28          | 3.45                           |           |       |       |       | 1.43  | 1.61  | 1.44  | 1.27  | 1.11   | 0.98                                     |  |
| 29          | 2.62                           |           |       |       |       | 1.04  | 1.18  | 1.33  | 1.50  |        | 4.57                                     |  |
| Means.      |                                | (0.87)    | 0.92  | 1.08  | 1.27  | 1.47  | 1.63  | 1.44  | 1.29  | (1.20) | (1.00)                                   |  |
| Departures. |                                | -0.04     | -0.06 | -0.04 | -0.01 | +0.01 | +0.05 | +0.09 | +0.18 |        |  |  |

\* Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*  
[Gram-calories per square centimeter.]

| Week be-<br>ginning | Average daily radiation. |               |               | Average daily departure<br>for the week. |               |               | Excess or deficiency<br>since first of year. |               |               |
|---------------------|--------------------------|---------------|---------------|--|---------------|---------------|--|---------------|---------------|
|                     | Wash-<br>ington.         | Madi-<br>son. | Lin-<br>coln. | Wash-<br>ington.                         | Madi-<br>son. | Lin-<br>coln. | Wash-<br>ington.                             | Madi-<br>son. | Lin-<br>coln. |
|                     | cal.                     | cal.          | cal.          | cal.                                     | cal.          | cal.          | cal.   | cal.          | cal.          |
| Oct. 1              | 386                      | 387           | 423           | +60                                      | +109          | +67           | -53  | +2,133        |               |
| 8                   | 355                      | 355           | 318           | +52                                      | +28           | -6            | +306   | +2,329        |               |
| 15                  | 275                      | 195           | 241           | -8                                       | -29           | -51           | +250   | +2,127        |               |
| 22                  | 258                      | 156           | 343           | -8                                       | -48           | +85           | +191   | +1,704        |               |

#### MEASUREMENTS OF THE SOLAR CONSTANT OF RADIA- TION AT CALAMA, CHILE, SEPTEMBER, 1920.

By C. G. ABBOT, Assistant Secretary.  
[Smithsonian Institution, Washington, Dec. 3, 1920.]

NOTE.—The above report having been delayed in transmission, will be included in the next (November) issue of the REVIEW.—Editor.